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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SCHECHTER, ANDREW M

ART UNIT PAPER NUMBER

2871

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/717,068

Applicant(s)

CHUNG ET AL.

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Applicant is advised that should claim 13 be found allowable, claim 20 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 6 and 12-20 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 6, 12, and 20 recite activating the liquid crystal material to have substantially the same characteristics as a liquid crystal material having a lower viscosity. The specification states that it is "heat-treated under a proper temperature" but gives no further details, not even describing what is a "typical liquid crystal" [p. 9]. Is the heat-treatment baking, flash-heating, freezing? Which liquid crystal materials (all, some, perhaps only one specific example?) respond to the proper heat-treatment to change their viscosities and other properties in the suggested way? The examiner assumes that the viscosities ($>100 \text{ mm}^2/\text{sec}$ and $20\text{-}50 \text{ mm}^2/\text{sec}$) are measured at the same temperature, so it appears that the heat-treatment causes the liquid crystal to undergo some phase change, which is however not discussed in the specification. The complete lack of such details or examples leads the examiner to the conclusion that either A) one of ordinary skill in the art would not be able to make and use the invention described in the specification, in which case this rejection is appropriate, or B) such heat-treating to produce the viscosity change is well-known within the art, making a detailed description seem superfluous to the applicant. This rejection can be overcome by submitting a reference illustrating this heat-treating to produce the viscosity change, thus demonstrating that those of ordinary skill in the art would be able to make and use the invention. For examining purposes below, it is assumed that this has been done, and the heat-treating process is assumed to be well-known to those of ordinary skill in the art.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 5, 6, and 12-20 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5, 6, 12, and 20 recite the viscosity of the liquid crystal material, but do not specify the temperature at which this is measured or the step during which the viscosity has the recited value. For claim 5, it is assumed that the viscosity is greater than 100 mm²/sec during the deposition step. For claims 6, 12, and 20, it is assumed that the viscosity is 20-50 mm²/sec after the deposition and after the activation.

Clarification by the applicant is required.

Claims 13-19 depend on claim 12.

7. Claims 3 and 12-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3, 12, and 20 recite "heat-treating" the liquid crystal material, which is not defined by the specification. What is the scope of "heat-treating"? Is any change of temperature considered "heat-treating"? Is cooling down the liquid crystal considered "heat-treating"? Clarification by the applicant is required.

8. Claims 6 and 12-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6, 12, and 20 recite "activated to have substantially the same characteristics as a liquid crystal material having a viscosity of 20 to 50 mm²/sec". This is unclear. Which characteristics are these? Is "a liquid crystal material" limited in any way? Different liquid crystal materials might have very different "characteristics" despite having similar viscosities. For examining purposes, it is assumed that "substantially the same characteristics" is restricted to the viscosity itself, so the claim language has the same scope as "activated to have a viscosity of 20 to 50 mm²/sec". Clarification by the applicant would be appreciated.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

10. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by *Kato et al.*, U.S. Patent No. 6,011,609.

Kato discloses [see Fig. 3, etc.] a fabricating method for an LCD panel comprising first and second substrates, rubbed orientation layers, depositing liquid crystal material, forming a seal, and attaching a liquid crystal material. There is also a heat-treating step [col. 3, line 56]. Claims 1-3 are therefore anticipated.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 1 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Abe*, U.S. Patent No. 5,511,591.

Abe discloses [see Fig. 8 for instance] a fabricating method for a liquid crystal display panel comprising substrate, depositing liquid crystal material via a dispenser, forming a seal [24] at the edge, and attaching the substrates. *Abe* does not disclose the orientation films, but these would be obvious to one of ordinary skill in order to properly orient the liquid crystal molecules. Claims 1 and 7 are therefore unpatentable.

From Fig. 9 and discussion thereof [cols. 8-9], it is clear that the dispenser repeatedly moves over the substrate in a preset manner while injecting liquid crystal, presumably controlled by a preset program. [If not, such automation would be obvious to do. Also, here the substrate moves and the dispenser is fixed; the relative motion is the same, however.] Claims 8 and 9 are therefore unpatentable.

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13. Claims 1-3, 5, 7, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Omeis et al.*, U.S. Patent No. 5,247,377.

Omeis discloses a fabricating method for a liquid crystal panel which could be used for display purposes, comprising providing first substrate, forming a first orientation film on it which is rubbed [cols. 6-7], depositing liquid crystal material on the first orientation film [col. 5], heat-treating the liquid crystal material ["tempering" col. 7] where the liquid crystal material has a viscosity greater than 100 mm²/sec [col. 5, lines 4-6]. The liquid crystal can be put down by a dispenser or spin-coating, rotating the orientation film to form a centrifugal force to deposit uniformly the liquid crystal [col. 5]. *Omeis* also discloses a second substrate ["layer of glass" col. 5, line 50] attached to the first substrate over the liquid crystal material.

Omeis does not disclose forming a second orientation film on the second substrate or forming a seal material at edges of the first substrate. This is in part because the examples given by *Omeis* are directed to single layers of liquid crystal for data storage. However, the examiner takes official notice that if this fabricating technique was used for making a liquid crystal display, it would be obvious to one of ordinary skill in the art to use the conventional second substrate with rubbed orientation layer, attached to the first with a seal at the edges of the first substrate. This ensures proper orientation of the liquid crystal molecules (near the second substrate, for TN devices, for instance) and prevents the liquid crystal from leaking out the edges of the device. Claims 1-3, 5, 7, 10, and 11 are therefore unpatentable.

Art Unit: 2871

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Omeis* as applied to claims 1-3, 5, 7, 10, and 11 above, and further in view of *Kim et al.*, U.S. Patent No. 5,742,370.

Omeis states that the deposition can be done by "conventional methods" [col. 5, lines 9-11] and lists several, which do not include being printed by a roller. However, this is an art-recognized equivalent to the methods mentioned by *Omeis*, as evidenced by *Kim* [col. 3, lines 55-57] which discloses liquid crystal "coated by a spin-casting, roll coating, or spray coating method". Claim 4 is therefore unpatentable.

15. Claims 6, 12, 13, 15, 18, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Omeis*, as applied to claims 1-3, 5, 7, 10, and 11 above, and further in view of *Ishii et al.*, U.S. Patent No. 5,642,214.

Considering the additional limitation of claim 6, *Ishii* teaches [col. 21, line 66 – col. 22, line 5] that a viscosity around 25-35 centipoise [1 cp is about 1 mm²/sec since the density of liquid crystal is close to 1 g/cc] is preferable for an LCD in order to obtain a high response speed. This overlaps the recited range of 20-50 mm²/sec, so a prima facie case of obvious in this respect exists. Assuming as discussed above under 35 U.S.C. 112 that the heat-treating process to change the liquid crystal material viscosity is well-known, it would therefore be obvious to one of ordinary skill in the art to carry it out, motivated by the teaching of *Omeis* that the higher viscosity is appropriate for the deposition process, and the teaching of *Ishii* that the lower viscosity is appropriate for the high response speed. Claim 6 is therefore unpatentable, as are claims 12, 13, 15, 18, 19, and 20.

16. Claims 14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Omeis* and *Ishii et al.* as applied to claims 12 and 15 above, and further in view of *Kim* and *Abe*.

Claim 14 is analogous to claim 4, and is rejected analogously. Claims 16 and 17 are analogous to claims 8 and 9. The dispensing method of *Abe* includes the limitations of these claims, and is also an art-recognized equivalent to the other deposition methods (spin-coating, rolling, dispensing, dipping), so these features would be obvious to one of ordinary skill in the art. Claims 16 and 17 are therefore unpatentable.

17. Claim 1-3, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kataoka et al.*, U.S. Patent No. 6,016,178.

Kataoka discloses a fabricating method for an LCD panel comprising providing first and second substrates [2, 1] with orientation layers [13, 10], depositing a liquid crystal material [7] on the first orientation layer, and attaching the first and second substrates. *Kataoka* does not explicitly disclose forming a seal material at edges of the first substrate, but the examiner takes official notice that this is conventional and well-known [practically required] so that the liquid crystal [9] does not fall out. Claim 1 is therefore unpatentable.

The orientation films [13, 10] are rubbed, so claim 2 is also unpatentable. The liquid crystal material [7] is spin-coated on and heat-treated [col. 8], so claims 3, 10, and 11 are unpatentable as well.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,055,035 to *von Gutfeld et al.* discloses a dispenser for liquid crystal material onto a substrate, and teaches that the "liquid crystal material may be heated to a predetermined temperature...to obtain a desired viscosity" to improve the deposition process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Sikes can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

AS

Andrew Schechter
July 26, 2002


TOANTON
PRIMARY EXAMINER